REMARKS

Claims 1 to 26 remain pending in the application, with claims 1, 15, 23 and 24 being the independent claims. Reconsideration and further examination are respectfully requested.

In the Office Action, objection was made to the Specification and to Figures 1 to 3 for including browser-executable code. In response, Applicants have amended the Specification above and are submitting the accompanying Request for Approval of Drawing Changes to eliminate any browser-executable code. In view of the above amendments and this submission, withdrawal of these objections is respectfully requested.

Applicants thank the Examiner for the telephonic interview conducted with Applicants' attorney on January 7, 2003. During that telephonic interview, the Examiner indicated that he would withdraw the 35 U.S.C. § 112, second rejection. In addition, the Examiner suggested the recitation of a processor for performing at least one of the steps in independent claims 1 and 15 in order to overcome the 35 U.S.C. § 101 rejection. This has been done above. Accordingly, withdrawal of the § 101 rejection is respectfully requested.

In the Office Action, claims 1 to 4, 6 to 8, 10 to 18 and 20 to 26 were rejected under 35 U.S.C. § 103(a) over U.S. Patent 5,812,988 (Sandretto) in view of U.S. Patent 5,745,383 (Barber) and U.S. Patent 5,842,199 (Miller); claim 5 was rejected under

§ 103(a) over Sandretto in view of Barber, Miller and U.S. Patent 5,761,442 (Barr); and claims 9 and 19 were rejected under § 103(a) over Sandretto in view of Barber, Miller and allegedly admitted prior art. Withdrawal of these rejections is respectfully requested for the following reasons.

The present invention generally concerns prediction of a target variable by creating a forecasting model based on a best fit of previously predicted values for plural "predictor variables" to historical values for a target variable and then using the forecasting model, together with currently predicted values for at least some of the predictor variables, to predict a value of the target variable, where the predictor variables are different than the target variable.

Thus, for example, assume that the predictor variables are the unemployment rate, the gross national product, and the inflation rate, and the target variable is the market price for a share of Microsoft common stock. Then, parameters of a forecasting model may be assigned, for example, by using stepwise linear regression to obtain a best fit of values predicted for the predictor variables on the first of each month in year 2001 to historical values of the share price for Microsoft common stock of the 15th of each month in year 2001. Once the forecasting model parameters have been defined in this manner, the forecasting model can be used to predict the future values of the Microsoft common stock share price. For example, predictions for the three predictor

variables made on May 1, 2002, might be plugged into the forecasting model to obtain a prediction for the share price of Microsoft common stock on May 15, 2002.

The creation of a forecasting model based on a comparison of predictions for a group of variables to historical values for a different target variable and then use of predictions for at least some of the prediction variables to predict the target variables has been found to provide better accuracy than can be achieved with many conventional forecasting models. In this regard, such conventional forecasting models, to the extent that they use other variables in connection with the prediction of a target variable, tend to use historical values for such other variables, either in the generation of the forecasting model or in the use of the forecasting model to predict a future values for the target variable. On the other hand, the present invention's use of predictions for the predictor variables both in the generation of the forecasting model and in the use of such forecasting model to predict a future value for the target variable often can pick up and incorporate information that is not available when only historical values are utilized.

For example, when the predictor value predictions are made by a large group of individual people, those predicted values often will incorporate attitudes of the population that may affect future changes in the economy. Moreover, because such predictions relate to variables that are different than the target variable, such predictions often will have fewer biases than direct predictions of the target variable.

For instance, some portion of the population (e.g., shareholders) might have a vested interest in the movement of the share price of the Microsoft common stock, while generally being free of any particular bias regarding inflation rates, gross national product or unemployment rates. As indicated above, use of such predictions of the predictor variables often can result in better predictions of the target variable.

Thus, independent claims 1 and 23 are directed to predicting a value of a target variable based on predictions of other variables. Historical values for the target variable are obtained at each of plural time points and both previously predicted values and currently predicted values for each of plural predictor variables are obtained, with the plural predictor variables being different from the target variable. Values are then assigned to parameters of a forecasting model to obtain a best fit of the previously predicted values for the plural predictor variables to the historical values for the target variable. Using such forecasting model and assigned values, a predicted value for the target variable is then generated from the currently predicted values for at least a subset of the plural predictor variables.

The foregoing combination of features is not disclosed or suggested by the applied art. In particular, the applied art does not disclose or suggest at least the features of assigning values to parameters of a forecasting model to obtain a best fit of previously predicted values for plural predictor variables to historical values for a target variable and then using the forecasting model and assigned values to generate a

predicted value for the target variable from currently predicted values for at least a subset of the plural predictor variables, where the plural predictor variables are different from the target variable.

In this regard, Sandretto concerns a technique for determining the net present values and risks for a group of assets. Specifically, Sandretto's technique utilizes an iterative process to estimate each asset's risk. See column 8, line 60 to column 11, line 55, which is summarized from column 8, line 60 to column 9, line 19. More specifically, Sandretto's process begins by estimating an initial set of financial statements and cash flows for each asset in a group. Thereafter, additional sets of cash flows are estimated using different economic variable estimates. Net present values are then determined based on expected inflation and a risk measurement for each asset. Returns are then calculated for each asset and simulated index returns are calculated for the assets as a group. The simulated returns for each asset are regressed against the simulated index returns in order to estimate an updated risk measure for each asset. Using these updated risk measures, Sandretto's previous steps are repeated, with this process continuing until risk measures for the assets stabilize.

The Office Action asserts that Sandretto discloses the feature of inherently assigning values to parameters of a forecasting model to obtain a best fit of values for predictor variables to historical values for a target variable. Initially, Applicants note that this is not the feature that is recited in independent claims 1 and 23 discussed

above. Rather, those claims recite the feature of assigning values to parameters of a forecasting model to obtain a best fit of the *previously predicted* values for the plural predictor variables to the historical values for the target variable.

Applicants are unable to find this feature disclosed, either expressly or inherently, anywhere in Sandretto. The only portion of Sandretto cited in the Office Action as showing such feature is column 4, line 60 to column 5, line 19. However, that portion of Sandretto merely discusses the Capital Asset Pricing Model (CAPM) which, according to Sandretto, simply involves: determining monthly returns for a particular asset (historical data), determining monthly returns for a stock index (historical data), and regressing the individual asset returns (historical data) against the market returns (historical data) in order to obtain a risk measure for the asset, which can then be used to estimate the rate at which future cash flows from the asset will be discounted. This, however, has nothing whatsoever to do with utilizing previously *predicted* values for predictor variables in order to create a forecasting model and then using that forecasting model to predict a value for a target variable (which is different than the predictor variables) from currently predicted values for at least a subset of the predictor variables. To the contrary, as described in Sandretto, and summarized above, CAPM only utilizes historical values in order to estimate a present value of an asset.

With regard to an allegation of inherency, the Federal Circuit has held as follows:

> To establish inherency, the *extrinsic evidence* [emphasis added] "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Id. at 1269, 20 U.S.P.Q.2d at 1749 (quoting In re Oelrich, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)).

In re Robertson, (Fed. Cir. 1999) 169 F.3d 743, 745; 49 U.S.P.Q.2d 1949.

However, in the present case no extrinsic evidence has been cited to show that the recited limitation *necessarily* was present in Sandretto's disclosure. In fact, as noted above, nothing in Sandretto's own disclosure seems to indicate that this feature of the invention is present.

Nothing else in Sandretto is seen to disclose or to suggest this feature of the invention. Rather, the remainder of Sandretto is only understood to concern the iterative improvement to CAPM that has be summarized above. Similarly, none of the other applied art appears to remedy this deficiency.

In the Office Action, it is asserted that Barber discloses the feature of obtaining previously predicted values for use with currently predicted values for each of plural predictor variables that is also used by the forecasting model. Once again, this is somewhat different than what is recited in claims 1 and 23. Those claims recite the

features of assigning values to parameters of a forecasting model to obtain a best fit of previously predicted values for plural predictor variables to historical values for a target variable and then generating a predicted value for the target variable from the currently predicted values for at least a subset of the plural predictor variables using the forecasting model and the values assigned to the parameters of the forecasting model. This is a two-step process that involves comparing predictions for a set of variables to historical values for a different (target) variable in order to assign forecasting model parameters; then, that model with those parameters is used predict a value for the target variable based on the current *predictions* for the set of variables.

In contrast, Barber appears merely to involve estimating a current value for a target variable based on current values for a set of predictors (i.e., a predictor vector) and also based on historical relationships between the target variable value and other known values for the predictor vector. See column 1, lines 20-25. One example given is the determination as to whether a particular point in a two-dimensional plane is more likely to be red or green given the colors of other points in the vector space. See column 1, lines 45-50. However, while Barber uses the term "predictor vector", it is clear from this example that he is comparing historical values for the predictor variables to historical values for the target variable in order to identify the relationship between the two. Then, based on that relationship and *current* values for the predictor variables, Barber estimates a current value for the target variable.

Barber does not appear to use predicted values either for the purpose of assigning parameters to a forecasting model or for predicting a value for his target variable. This conclusion is supported by the first cited portion of Barber's specification, *i.e.*, column 1, lines 5-17, which only refers to historical values of the predictor variables. The second cited portion, *i.e.*, column 3, lines 30-45, merely notes that it generally is not necessary to identify an optimal hyperplane.

Finally, Miller is not seen to make up for the foregoing deficiencies of Sandretto and Barber. In this regard, the cited portion of Miller, *i.e.*, column 2, lines 35-43, only generally describes the desirability of being able to compare the predictive utility of various competing prediction algorithms, and says nothing at all about the particular prediction technique of the present invention.

Lacking these features of the present invention, no permissible combination of the applied art would have rendered obvious the above-referenced claims. Accordingly, independent claims 1 and 23 are believed to be allowable over the applied art.

Independent claims 15 and 24 are directed to predicting a value of a target variable based on predictions of other variables. Historical values for the target variable are obtained at each of plural time points, and previously predicted values and currently predicted values for each of plural predictor variables are obtained, with the plural predictor variables being different from the target variable. A subset of the plural predictor variables whose previously predicted values provide a best fit to the historical

values for the target variable are then identified by using stepwise linear regression. Using weighting coefficients from the stepwise linear regression, a predicted value for the target variable is generated from the currently predicted values for the identified subset of the plural predictor variables.

The foregoing combination of features is not disclosed or suggested by the applied art. In particular, the applied art does not disclose or suggest at least the features of identifying a subset of plural predictor variables whose previously predicted values provide a best fit to the historical values for a target variable by using stepwise linear regression and then generating a predicted value for the target variable from currently predicted values for an identified subset of the plural predictive variables, using weighting coefficients obtained from the stepwise linear regression.

As noted above, the applied art does not even disclose or suggest the use of previously predicted values for predictor variables to obtain a forecasting model and then use of currently predicted values for at least some of the predictor variables in connection with the forecasting model to generate a predicted value for a target variable that is different than the predictor variables. Accordingly, the prior art could not possibly have suggested the above-referenced features of independent claims 15 and 24. Accordingly, claims 15 and 24 also are believed to be allowable over the applied art.

The other claims in the application depend from the independent claims discussed above and are therefore believed to be allowable for at least the same

reasons. Because each such dependent claim recites at least one additional feature of the present invention, the individual reconsideration of each on its own merits, in view of the above remarks, is respectfully requested.

In view of the foregoing remarks, the entire application is believed to be in condition for allowance, and an indication to that effect is respectfully requested.

If there are any fees due in connection with the filing of this paper that have not been accounted for in this paper or the accompanying papers, please charge the fees to our Deposit Account No. 13-3735. If an extension of time under 37 C.F.R. 1.136 is required for the filing of this paper and is not accounted for in this paper or the accompanying papers, such an extension is requested and the fee (or any underpayment thereof) should also be charged to our Deposit Account. A duplicate copy of this page is enclosed for that purpose.

Respectfully submitted,

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Dated: January 10, 2003

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APPENDIX A

Specification Marked to Indicate Changes

Page 2, lines 13 to 24:

A number of forecasting contests have been conducted in the past. Such contests range from various wagering events, such as Superbowl pools, to various financial forecasting contests. Typically, such conventional contests seek to identify the best predictor for the outcome of a single event. For example, the Investorsforecast website [at www.investorsforecast.com] allows participants to predict where the Dow Jones Industrial Average (DJIA) will be and what the prices of certain stocks will be at the end of next week. The person submitting the most accurate prediction for the DJIA and the person submitting the most accurate prediction for an individual stock are each given a fixed monetary award, such as $300. Other contests in the financial arena typically allow participants to invest an imaginary amount of money, with the winner being the person whose portfolio is the largest at the end of the contest. One example of such a contest can be seen at the Fantasystockmarket website [www.fantasystockmarket.com].

Page 3, lines 19 to 25:

In conventional forecasting contests, participants typically submit their predictions by writing, typing or speaking their predictions. Most frequently, such predictions consist of a numerical estimate of what the value of the predicted variable will be at a specified point in time. Thus, for instance, in the Investorsforecast [www.investorsforecast.com] website contest mentioned above, participants type in the values of their estimates and then submit those estimates by clicking a button on the website.

Page 4, lines 4 to 16:

While other prediction submission techniques have been utilized, they typically have had very limited applicability. For example, the Cyberskipper website [at www.cyberskipper.com] permits participants to compete in predicting certain sports-related events. One of the prediction submission techniques utilized by this site is to display a grid of possible events. The participants can then click on a cell within the grid to designate their prediction that a particular event will occur. Thus, a different grid is displayed for each baseball game, with each row of the grid corresponding to a different baseball player and each column corresponding to a different event (e.g., "runs", "hits", home run"). If a participant believes that a certain player will get a home run in a game, he simply clicks on the appropriate cell to enter that prediction. As can be readily appreciated, this technique generally is limited to predicting binary events (i.e., will/will-not occur). In many cases, this deficiency will limit the applicability of such techniques to collection of very coarse predictions.

Page 6, lines 27 to 36:

Another set of "Rocket Science" tools has become popular during the 1990s, the "computationally intensive" forecasting tools. Using massive computerized databases, mathematical search algorithms are employed to find "black boxes" for forecasting. Such techniques include "neural networks", large systems of empirically based equations with parameters that evolve over time. Neural networks appear to be used, for example, in creating the forecasts produced by the Forecasts website [www.forecasts.org]. Ideally, neural networks learn from their mistakes and self correct. Although neural networks are the foundation of numerous automated trading and

arbitrage systems on Wall Street, in practice they sometimes "learn" too slowly and converge on very localized forecasting rules, which do not generalize well.

Page 7, lines 19 to 37:

The final category of forecasts, so-called "consensus forecasts", is similar to opinion-poll surveys but with a key difference. In public opinion polls, random populations are sampled. In creating a consensus forecast, polls and surveys of economic and financial forecasters (and, sometimes, published forecasts) are conducted. Typically, the median value across participants is the consensus forecast. These surveys have proven to be quite good, generally outperforming over time the individual forecasters who are included in the panel underlying the consensus forecast. Consensus forecasts are regularly conducted for corporate earnings, money supply and interest rates, and key macroeconomic variables. For example, both IBES and First Call survey stock analysts to identify expected corporate earnings. MMS surveys bank economists to estimate the money supply figures on the upcoming Federal Reserve H-6 reports. Blue Chip Economic Indicators was perhaps the first service providing median and average forecasts from a group of forecasters for general economic variables [(see www.bluechippubs.com)]. The National Association of Business Economists Forecast Survey provides at least quarterly reports on what its membership anticipates for certain general economic variables. The Federal Reserve conducts similar surveys of about 30 economic forecasters with results published regularly in the financial press.

Page 26, line 36 to page 27, line 8:

Also in the preferred embodiment of the invention, participants may enter and revise their predictions as frequently as they like. In fact, providing new predictions and revising those predictions as early as possible are encouraged with incentives.

This differs from many conventional contests [(such as the contests at www.eas.purdue.edu/forecast and www.PredictIt.com)] and provides the advantage that the prediction database resulting from the contest becomes more heavily populated and tends to include predictions that are updated or newly submitted more or less continuously, rather than mainly at discrete points in time. The resulting database can often be more useful for combination forecasts, as well as for other purposes of statistical analysis.

APPENDIX B

Claims Marked to Show Changes

1. (Twice Amended) A method for predicting a value of a target variable based on predictions of other variables, said method comprising:

obtaining historical values for the target variable at each of plural time points;

obtaining previously predicted values and currently predicted values for each of plural predictor variables, the plural predictor variables being different from the target variable;

assigning values to parameters of a forecasting model to obtain a best fit of the previously predicted values for the plural predictor variables to the historical values for the target variable; and

[generating] utilizing a computing device to generate a predicted value for the target variable from the currently predicted values for at least a subset of the plural predictor variables using the forecasting model and the values assigned to the parameters of the forecasting model.

15. (Twice Amended) A method for predicting a value of a target variable based on predictions of other variables, said method comprising:

obtaining historical values for the target variable at each of plural time points;

obtaining previously predicted values and currently predicted values for each of plural predictor variables, the plural predictor variables being different from the target variable;

identifying a subset of the plural predictor variables whose previously predicted values provide a best fit to the historical values for the target variable, by using stepwise linear regression; and

[generating] utilizing a computing device to generate a predicted value for the target variable from the currently predicted values for the subset of the plural predictor variables identified in said identifying step using weighting coefficients obtained from the stepwise linear regression.